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10/536,762	11/30/2005	Nigel Paul Schofield	M02B159	2846

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EXAMINER	
BOBISH, CHRISTOPHER S	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/536,762	SCHOFIELD, NIGEL PAUL
	Examiner	**Art Unit**
	CHRISTOPHER BOBISH	3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _06 October 2008_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-16_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-16_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The amendment filed on 10/06/2008 under 37 CFR 1.131 has been considered but is ineffective to overcome the Stones (US Patent No. 6,135,709) reference.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4 and 6-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stones (United States Patent No. 6,135,709) in view of Curry et al (United States Patent No. 6,739,840 B2).

Stones teaches:

limitations from claim 1, a vacuum pumping arrangement for controlling pressure in a chamber, comprising a molecular pumping mechanism, **FIG. 3 (50) C.2 Lines 61-63**, and a backing pumping mechanism, **FIG. 3 (1) C. 2 Lines 5-6**, the backing pumping mechanism being rotatable by at least a 2kw motor, **FIG. 1 (7) C. 2 Lines 13-15**, the motor being arranged to rotate the molecular pumping mechanism simultaneously with the backing pumping mechanism; **Stones teaches a common rotor, FIG. 3 (9), coupling the two mechanisms to the shaft, FIG. 1 (6), the molecular section, FIG. 3 (52) C. 2 Lines 65-68, and the regenerative (backing) section, FIG. 1 (1) or FIG 3 (1) C. 2 Lines 47-51; so it is inherent that the motor will drive both sections simultaneously;**

further, the recitation of a motor as having to be at least 2 kW is merely a design choice. One of ordinary skill in the art would be motivated to choose a motor of sufficient power to be able to run a pump of a particular size and strength. It would not take an inventive step to change the size of a motor to match the needs of a pump, as it is known that insufficient motor capacity may lower the efficiency of a pump and may also cause damage to the device,

Stones does not teach a means of controlling rotational speeds of the mechanisms of claim 1, but Curry does.

Curry teaches a control means, **FIG. 1 (177) C. 6 Lines 28-33**, for controlling rotational speeds of the molecular pumping mechanism; **Curry teaches the use of his control means with staged or cooperative pumping arrangements as well; furthermore, both mechanisms (backing, molecular) are attached to a single shaft and motor so that if one speed is controlled then the other speed must also be controlled**. **C. 5 Lines 37-57, 50-52**;

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the control apparatus taught by Curry with the Vacuum pump taught by Stones to create a more energy efficient pump as well as a more adaptable pump. Curry provides motivation in C. 1 Lines 18-53;

Stones and Curry teach and disclose the pumping arrangement of claim 1 and Stones further discloses;

limitations from claim 2, the vacuum pumping arrangement as claimed in claim 1, wherein the molecular pumping mechanism and the backing pumping mechanism are driven by a common drive shaft which is driven by the motor; **Stones teaches a common rotor, FIG. 1 (9), coupling the two mechanisms to the shaft, FIG. 1 (6), the molecular section, FIG. 3 (52) C. 2 Lines 65-68, and the regenerative (backing) section, FIG. 1 (9) or FIG 3 (9) C. 2 Lines 47-51; so it is inherent that the motor will drive both sections**;

limitations from claim 3, the vacuum pumping arrangement as claimed in claim 1, wherein the molecular pumping mechanism comprises a molecular drag pumping mechanism; **FIG. 3 (2) C. 2 Lines 5-8**;

limitations from claim 4, the vacuum pumping arrangement as claimed in claim 3, wherein the molecular drag pumping mechanism comprises a Holweck pumping mechanism; **FIG. 3 (2) C. 2 Lines 18-25**;

limitations from claim 6, the vacuum pumping arrangement as claimed in claim 1, wherein the molecular pumping mechanism comprises a turbomolecular pumping means; **FIG. 3 (50) C.2 Lines 61-63**.

limitations from claim 7, the vacuum pumping arrangement as claimed in claim 1, wherein the backing pumping mechanism is a regenerative pumping mechanism; **FIG. 3 (1) C. 2 Lines 5-6**;

limitations from claim 9, a method of controlling pressure in a chamber connected to an inlet of a vacuum pumping arrangement including a backing pumping mechanism, **FIG. 3 (1) C. 2 Lines 5-6**, and a molecular pumping mechanism, **FIG. 3 (50) C.2 Lines 61-63**, and at least a 2 kW motor for driving the backing pumping mechanism, **FIG. 1 (7) C. 2 Lines 13-15**, the method comprising using the motor to control rotation of the molecular pumping mechanism thereby controlling pressure in the chamber;

further, the recitation of a motor as having to be at least 2 kW is merely a design choice. One of ordinary skill in the art would be motivated to choose a motor of sufficient power to be able to run a pump of a particular size and strength. It would not take an inventive step to change the size of a motor to match the needs of a pump, as it is known that insufficient motor capacity may lower the efficiency of a pump and may also cause damage to the device,

limitations from claim 10, a method as claimed in claim 9, wherein the backing pumping mechanism and the molecular pumping mechanism are coupled to a common drive shaft and the method comprises using the motor to control rotation of the common drive shaft thereby controlling pressure in the chamber; **Stones teaches a common rotor, FIG. 3 (9), coupling the two mechanisms to the shaft, the molecular section, FIG. 3 (52) C. 2 Lines 65-68, and the regenerative (backing) section, FIG. 1 (9) or FIG 3 (9) C. 2 Lines 47-51; so it is inherent that the motor will drive both sections, thereby controlling a pressure in a chamber;**

limitations from claim 11, a vacuum pumping arrangement as claimed in claim 3, wherein the molecular pumping mechanism comprises a turbomolecular pumping means; **FIG. 3 (50) C. 1 Lines 27-30**;

limitations from claim 12, a vacuum pumping arrangement as claimed in claim 4, wherein the molecular pumping mechanism comprises a turbomolecular pumping means, **FIG. 3 (50) C. 1 Lines 27-30 and 36-39**;

limitations from claim 13, a vacuum pumping arrangement as claimed in claim 6, wherein the backing pumping mechanism is a regenerative pumping mechanism; **FIG. 3 (1) C. 2 Lines 5-6**;

Stones and Curry teach and disclose the vacuum pumping arrangement of claim 13 but Stones does not teach a means to control the pump speed. Curry does.

Curry further teaches:

limitations from claim 14, a vacuum pumping arrangement as claimed in claim 13, wherein the control means, **FIG. 1 (177) C. 6 Lines 28-33**, comprises means for measuring the pressure in the chamber, **C. 3 Lines 63-67**, and means for changing the rotational speeds of the molecular pumping mechanism and the backing pumping mechanism, **C. 5 Lines 37-57,** in dependence on the measured pressure, **C. 9 Lines 9-1**;

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the control apparatus taught by Curry with the Vacuum pump taught by Stones to create a more energy efficient pump as well as a more adaptable pump. Curry provides motivation in C. 1 Lines 18-53;

limitations from claim 15, a vacuum pumping arrangement as claimed in claim 11, wherein the backing pumping mechanism is a regenerative pumping mechanism; **FIG. 3 (1) C. 2 Lines 5-6**;

limitations from claim 16, a vacuum pumping arrangement as claimed in claim 12, wherein the backing pumping mechanism is a regenerative pumping mechanism; **FIG. 3 (1) C. 2 Lines 5-6**;

Stones and Curry teach and disclose the vacuum pumping arrangement of claim 1 but Stones does not teach a means to control the pump speed. Curry does.

Curry further teaches:

limitations from claim 8, the vacuum pumping arrangement as claimed in claim 1, wherein the control means, **FIG. 1 (177) C. 6 Lines 28-33**, comprises means for measuring the pressure in the chamber, **C. 3 Lines 63-67**, and means for changing the rotational speeds of the molecular pumping mechanism and the backing pumping mechanisms, **C. 5 Lines 37-57,** in dependence on the measured pressure, **C. 9 Lines 9-17;**

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the control apparatus taught by Curry with the Vacuum pump taught by Stones to create a more energy efficient pump as well as a more adaptable pump. Curry provides motivation in C. 1 Lines 18-53;

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stones (United States Patent No. 6,135,709) in view of Curry et al (United States Patent No. 6,739,840 B2) as applied to claim 1 above, in further view of Schofield (United States Patent No. 5,772,395).

Stones and Curry disclose and teach the vacuum pump of claim 1 but do not teach a carbon fiber reinforced cylinder for use in the Holweck pump section. Schofield does.

Schofield teaches:

limitations from claim 5, the vacuum pumping arrangement as claimed in claim 4, wherein a holweck cylinder of the Holweck pumping mechanism is formed from carbon fiber reinforced material; **C. 2 Lines 3-6. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use this material in the pump taught by Stones to increase durability and wear resistance while also decreasing weight.**

Response to Arguments

Applicant's arguments filed 10/06/2008 have been fully considered but they are not persuasive.

In response to the applicant's argument that the Stones reference does not teach "a method of controlling the pressure in a chamber connected to a vacuum pumping arrangement including a backing pumping mechanism and a molecular pumping mechanism, and a motor for driving the backing pumping mechanism, comprising the step of using the motor to control rotation of the molecular pumping mechanism", examiner disagrees for the following reasons. As stated in the previous rejections, Stones teaches both a molecular (50) and a backing (1) pumping mechanism, and because they are connected by a common rotor (9), they will obviously rotate simultaneously. It is commonly known that vacuum pumps are used to control the pressure or vacuum inside of a chamber, especially in the manufacturing of electronics. Because the motor (7) rotates both pumping mechanisms, including the molecular pumping mechanism, the motor will directly control the rotation of the mechanism and therefore the pressures produced by the vacuum. That is to say, if the vacuum pump produces a vacuum, and the vacuum is created, at least in part, by a molecular pumping mechanism, and the mechanism is rotated by the motor, then the pressure is ultimately controlled by the motor.

Applicant also argues that the combination of the Curry and the Stones references does not teach “a motor being arranged to rotate the molecular and backing pumping mechanisms simultaneously and a control means for controlling the rotational speeds of both mechanisms". However as stated above, both mechanisms are connected to the same shaft, rotated by a single motor, therefore they must rotate together. As for the controller, Curry teaches in C. 6 Lines 28-33 and C. 9 Lines 9-15 that a speed of a vacuum pump can be controlled based on an operating characteristic in order to change a desired chamber pressure. Curry further teaches that the operating characteristic can be one of many, including pressure, C. 3 Lines 63-67. Again, both mechanisms taught by Stones (molecular and backing) are connected to the same shaft and a single motor, should the speed of one mechanism be changed, the other will be as well.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER BOBISH whose telephone number is (571)270-5289. The examiner can normally be reached on Monday through Thursday, 7:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571)272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher Bobish/
Examiner, Art Unit 3746

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit 3746

/C. B./

Examiner, Art Unit 3746